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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/529,234 | 08/31/2005 | Charles M Ward-Close | 4827-5 | 2518 |

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| EXAMINER | |
|---|---|
| KESSLER, CHRISTOPHER S | |
| ART UNIT | PAPER NUMBER |
| 1793 | |
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| 10/06/2009 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/529,234 | WARD-CLOSE ET AL. | |
| | Examiner | Art Unit | |
| | CHRISTOPHER KESSLER | 1793 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *14 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *31-35,37-39 and 41-61* is/are pending in the application.

4a) Of the above claim(s) *32, 34, 35, 44, 46-50* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *31,33,37-39,41-43,45 and 51-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 14 July 2009 has been entered.

### *Status of Claims*

2. Responsive to the amendment filed 14 July 2009, claims 31, 45, 51, and 54 are amended. Claims 31, 33, 37-39, 41-43, 45 and 51-61 are currently under examination.

### *Status of Previous Rejections*

3. Responsive to the amendment filed 14 July 2009, new grounds of rejection are presented.

### *Claim Rejections - 35 USC § 103*

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 31, 33, 37-39, 41-43, 45 and 51-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over UK Patent Application GB 2,362,164 A (hereinafter "Godfrey"), in view of US Patent 2,876,094 issued to Lusby, Jr. (hereinafter "Lusby").

Regarding claim 31, Godfrey teaches a method of making titanium particles by electrolytic reduction (see abstract, title, page 1). Godfrey teaches that titanium particles are produced by an electrochemical reduction process (see Example, pp. 2-3). Godfrey teaches that the particles are Godfrey teaches that after the electrochemical reduction process, the metal particles are purified by washing in acid to remove salt and then washing in water to remove the acid (see p. 3).

Godfrey does not teach that the metal particles are purified by introducing into a heat source such that the particles are out of contact of any surfaces, at temperature equal to or higher than the melting point of the metal so as to vaporize impurities, removing the vaporized impurities, cooling the purified particles, and collecting the purified metal in solid form.

Lusby teaches a method of purifying titanium or other refractory metals (see col. 1). Lusby teaches that the inventive method includes introducing the metal particles into a heat source (see col. 2, Example 1 in col. 2, and the Figure). Lusby teaches that the heat source comprises induction coils (see Example, and col. 3). Lusby teaches that the particles are out of contact with any surfaces during the treatment (see Figure, col. 2 and col. 4). Lusby teaches that the particles are heated until melting (see cols. 1-2 and Example). Lusby teaches that the impurities are vaporized and withdrawn from the system (see cols. 1-2, Example 1 and Figure). Lusby teaches that the purified metal

particles are cooled and collected in solid form (see cols. 1-2, Example 1, and the Figure).

It would have been obvious to have used the method of Lusby to have purified the particles of Godfrey, because Lusby teaches that this method avoids contamination with O, H and N and also avoids contamination of the metal that comes from contact with the surface of the apparatus (see col. 1 and 4).

Regarding claim 33, Godfrey teaches that the particles are a powder (see p. 3).

Regarding claim 37, Lusby teaches that the method is conducted in an apparatus comprising a heat source and a collection means for the purified particles (see cols. 1-2, Example 1 and Figure). Lusby further teaches that the vaporized impurities may be withdrawn from the system (see cols. 1-2, Example 1 and Figure). Although Lusby does not explicitly describe any collection means, it would have been obvious to one of ordinary skill in the art that a separate collection means would have been employed, because Lusby teaches that the hot vapor will condense into a hot molten pool (see cols. 1-2), which one of ordinary skill in the art would recognize as potentially dangerous.

Regarding claim 38, Lusby teaches that the particles are free to fall through the heat source (see cols. 1-2, Example 1 and Figure).

Regarding claim 39, Lusby teaches that the distance of the fall may be great enough that the molten particles will re-solidify prior to collection (see col. 2).

Regarding claim 41, Godfrey in view of Lusby does not teach that the vaporized impurities are collected on cold collector plates adjacent the heat source, and disposing

of the impurities. However, these steps are would have been obvious to one of ordinary skill in the art. The examiner takes Official notice that the steps of claim 41 would have been obvious to one of ordinary skill in the art in order to safely deal with the vaporized impurities. Applicant is further directed to MPEP 2144.03.

Regarding claim 42, Lusby teaches that the metal is melted, but does not teach that the metal is vaporized (see cols. 1-2 and Example 1). Thus, the limitation of heating over the melting point but below the vaporization point is met.

Regarding claim 43, Godfrey teaches that the metal is titanium (see p. 1 and Example).

Regarding claim 45, Godfrey teaches that the impurities comprise calcium (see p. 3).

Regarding claim 51, Lusby teaches that the particle size is adjusted by one of ordinary skill in the art in order to obtain the desired purity and surface area for the metal (see col. 3). Thus the particle size is a results-effective variable and would have been optimized by one of ordinary skill in the art through routine experimentation. Applicant is further directed to MPEP 2144.05.

Regarding claim 52, Godfrey teaches that the particles pass through a 250 μm sieve (see p. 3).

Regarding claim 53, Lusby teaches that the particles are free to fall through the heat source and out of contact with any surfaces (see cols. 1-2, Example 1 and Figure).

Regarding claim 54, Lusby teaches that the particles are out of contact with any surfaces and within an induction coil (see cols. 1-2, col. 4, Example 1 and Figure).

Regarding claim 55, Lusby teaches that the particles are heated and melted and resolidified out of contact with any surfaces (see cols. 1-2, col. 4, Example 1 and Figure).

Regarding claim 56, Lusby teaches that the purification is conducted in a controlled atmosphere (see col. 2, col. 3 and Figure).

Regarding claim 57, Lusby teaches that the purification may further comprise a washing with acid or water (see col. 2-3).

Regarding claim 58, Lusby teaches that the method is conducted in an apparatus comprising a heat source and a collection means for the purified particles (see cols. 1-2, Example 1 and Figure). Lusby further teaches that the vaporized impurities may be withdrawn from the system (see cols. 1-2, Example 1 and Figure). Although Lusby does not explicitly describe any collection means, it would have been obvious to one of ordinary skill in the art that a separate collection means would have been employed, because Lusby teaches that the hot vapor will condense into a hot molten pool (see cols. 1-2), which one of ordinary skill in the art would recognize as potentially dangerous.

Regarding claim 59, Lusby teaches that the particles are spherical and impurities are lowered (see col. 2).

Regarding claim 60, Godfrey in view of Lusby does not teach what the level of impurities is. However, Lusby teaches that the level of impurities can be adjusted by one of ordinary skill in the art by the method (see col. 3). Thus it would have been

obvious to one of ordinary skill in the art to have purified the metal to the desired purity level using the process. Applicant is further directed to MPEP 2144.04.

Regarding claim 61, Godfrey in view of Lusby does not teach what the level of purification is. However, Lusby teaches that the level of impurities can be adjusted by one of ordinary skill in the art by the method (see col. 3). Thus it would have been obvious to one of ordinary skill in the art to have adjusted the process to the desired purification level. Applicant is further directed to MPEP 2144.04.

### *Response to Arguments*

6. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER KESSLER whose telephone number is (571)272-6510. The examiner can normally be reached on Mon-Fri, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

csk